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Review of the South African Cuckoo-Bee Genus *Pseudodichroa* (Hymenoptera, Apoidea)

By Jerome G. Rozen, Jr.[1]

In connection with a recent biological study of the anthophorid genus *Pseudodichroa* (Nomadinae, Ammobatini) and of its hosts of the colletid genus *Scrapter,* I borrowed all available specimens of *Pseudodichroa* in order to check species identifications. Once the specimens were on hand, I decided to review the systematics of the genus because no previous comprehensive study of the genus had been made. The present paper, a result of the review, recognizes only two species, both previously described. Found only in the Western Cape region of the Republic of South Africa (fig. 1), they are sympatric with the host genus but are more restricted in distribution. Details of the biology of both species were given by Rozen and Michener (1968).

In 1951 Popov divided the tribe Ammobatini (in the sense of Michener, 1944) into the Ammobatini and the Pasitini on the basis of the male genitalia and terminal metasomal sterna. *Pseudodichroa* was known from females alone, and consequently it was only tentatively placed in the Pasitini. Because the males of the genus are still uncollected and because I suspect that the anatomy of females of the Ammobatini-Pasitini complex may not fully support Popov's tribal division, Michener's concept of the Ammobatini is adopted here.

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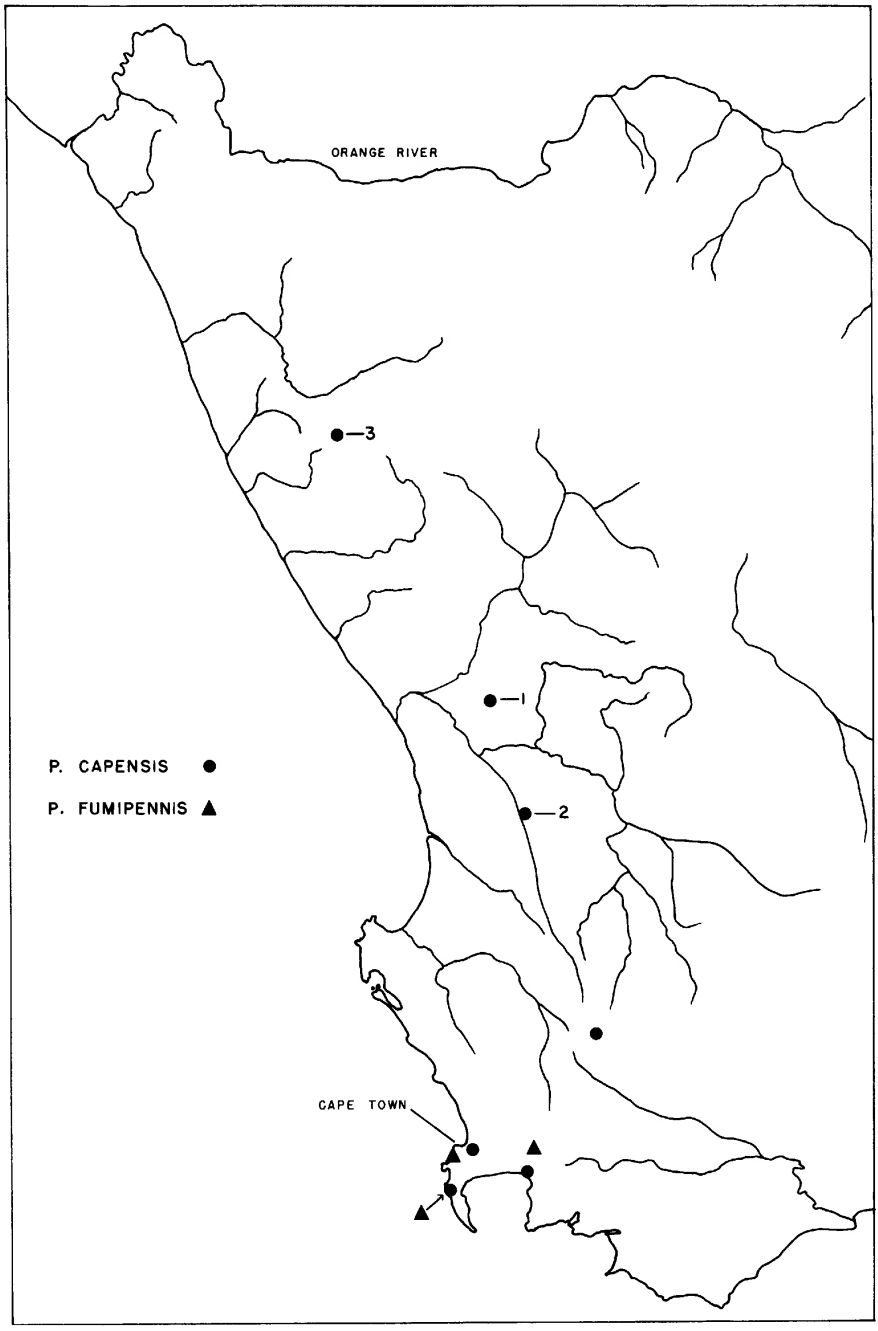


FIG. 1. Western Cape region of the Republic of South Africa, showing distribution of *Pseudodichroa capensis* and *fumipennis*.

A survey of females of a number of the genera of the Ammobatini reveals many excellent taxonomic features in the configuration and vestiture of the sixth metasomal tergum and of the fifth and sixth sterna. Future revisionary work on the tribe will undoubtedly rely heavily on these structures for the establishment of specific and generic boundaries. It has been evident for many years (Linsley and Michener, 1939; Bohart, 1966) that the highly modified shapes of the sixth metasomal sterna of the Nomadinae are diagnostic and that they must serve special functions in oviposition. The fifth sternum and the sixth tergum must also be an integral part of the functional egg-laying apparatus. How this apparatus is employed in the various genera has not been observed for any nomadine bee, but a clearer understanding is approaching because we now realize that the groups of Nomadinae have very different types of eggs and that they lay their eggs in distinctive positions. *Pseudodichroa* may use the elongate, heavily sclerotized, median process of the sixth sternum to puncture an opening through the strong, cellophane-like lining of the *Scrapter* cell and then to poke a hole in the sand to accommodate the parasite egg.

I wish to thank Dr. Eberhard Königsmann, Institut für Spezielle Zoologie und Zoologisches Museum, Humboldt-Universität, Berlin, for allowing me to borrow the type of *P. capensis*. The following people have kindly lent material in their charge: Dr. A. J. Hesse, South African Museum, Cape Town; Dr. C. D. Michener, the University of Kansas, Lawrence; Dr. E. C. G. Pinhey, National Museum of Southern Rhodesia, Bulawayo; Dr. L. Vári, Transvaal Museum, Pretoria, Republic of South Africa; and Dr. I. H. H. Yarrow, British Museum (Natural History), London.

SYSTEMATIC TREATMENT

PSEUDODICHROA BISCHOFF

Pseudodichroa BISCHOFF, 1923, pp. 586, 595 [type, by subsequent designation, *Omachtes capensis* Friese (Sandhouse, 1943, p. 593)]. GRÜTTE, 1935, pp. 507, 508. LINSLEY AND MICHENER, 1939, p. 269 (assigned to the Ammobatini). MICHENER, 1944, p. 276. POPOV, 1951, p. 897 (assigned tentatively to the Pasitini). ROZEN AND MICHENER, 1968, pp. 9–13 (biology).

DIAGNOSIS: *Pseudodichroa* can be separated from all other genera of the Ammobatini (*sensu* Michener, 1944) because of the greatly elongate, apically simple median process of the sixth metasomal sternum (figs. 9, 10). This process is bifurcate in other genera. Unfortunately, the sixth segment on bee specimens is often partly telescoped into the preceding segments so that the shape of the sternum may be difficult to see in some cases. *Pseudodichroa* can be distinguished from other ammobatine genera

also by the distinctive shape and vestiture of the fifth metasomal sternum and of the sixth metasomal tergum.

DESCRIPTION: Body form moderately slender; length 6.0 to 11.0 mm.

Head: Color black; punctation moderately fine, dense, and contiguous over most of the face; vestiture of face composed of abundant, moderately long, suberect black hairs except for inconspicuous shorter, but more plumose, white setae (in addition to black ones) on labrum and between antennal sockets; genal vestiture primarily dark. Inner orbits converging moderately below; clypeal protuberance moderate; genal area as seen from side moderately narrow, about half as wide as width of eye. Mandibles long; in repose, mandibles crossing each other and with apices directed somewhat posteriorly (fig. 2); maxillary palpi long, five-segmented.

Mesosoma: Color black; punctation moderately fine, dense, and contiguous; propodeal triangle dull owing to fine sculpturing; vestiture predominantly consisting of long black hairs; inconspicuous, shorter, more plumose, suberect white hairs present, especially on lateral angles and lateral lobes of pronotum, on metanotum, on propodeum, and on mesepisternum; vestiture in no instance so abundant as to hide integument. Anterior face of mesepisternum not separated by carina and furrow from lateral face. Mesoscutellum at most with very weak median longitudinal furrow. Wings uniformly infuscated; two submarginal cells present; second submarginal cell receiving first recurrent vein as well as second recurrent vein (figs. 3, 4), i.e., first recurrent vein not interstitial with first transverse cubital.

Legs: Color black to reddish brown, only rarely hind legs nearly as pale as red of metasoma; vestiture of dorsal surface of each tibia not completely hiding integument. Anterior femur without sharp ridge running length of ventral surface. Middle coxa, as seen in lateral view, moderate in size, being about equal in length to distance between coxa and base of hind wing.

Metasoma: Color of terga I to III red except usually for dark area at base of tergum I and, in some cases, for dark apical margin of tergum III and even tergum II; terga IV, V, and VI usually dark brown or black, although one specimen with entire metasoma red. Punctation of metasoma generally fine and inconspicuous. Vestiture of metasoma mostly black and sparse so that only integument of tergum VI and of apical part of sternum V somewhat obscured. Terga I to III without band of light hairs on apical margin, although with very fine, short, scattered, pale, inconspicuous setae, at least on some terga; tergum IV with pale setae on apical margin, although still inconspicuous, somewhat more

abundant than similar setae on preceding tergum; tergum V with pale setae on apical margin still more abundant so that pale marginal hair band somewhat evident. Tergum VI (fig. 8) curved, produced posteriorly, without sharp lateral margins and without pygidial plate; dorsal surface beset with long, abundant, erect, black or dark brown setae, some of which project at right angles to tergum. Sterna I to IV with at most scattered inconspicuous pale setae on apical margins; sternum V (figs. 5–7) with apex produced into median, bare, coriaceous gutter that folds around and channels median process of sternum VI and that often is frayed apically on older specimens; this gutter-like process surrounded by fine, pale, decumbent setae which in turn are surrounded by (and to some extent mixed with) numerous suberect, posteriorly directed, long, stiff, dark setae. Sternum VI (figs. 5, 6, 9, 10) produced medially into an elongate process that is apically simple.

Pseudodichroa capensis (Friese)

Figures 1–3, 5, 7–10

Omachtes capensis FRIESE, 1915, p. 296 [female; "vom Kapland"; Zoologisches Museum, Berlin].

Pseudodichroa capensis: BISCHOFF, 1923, p. 595. SANDHOUSE, 1943, p. 593 (designated type of genus). ROZEN AND MICHENER, 1968, pp. 9–13 (biology).

DIAGNOSIS: Although *P. capensis* and *fumipennis* are similar, they can be recognized by the dissimilar appearance of the light hairs surrounding the apical gutter of the fifth metasomal sternum (figs. 5, 6), by the color of the tibial spurs of the middle and hind legs, by the fact that the posterior length of the first and second submarginal cells (fig. 3) of *P. capensis* are usually equal, and usually by the body size.

DESCRIPTION: Body form moderately slender, more so than that of *P. fumipennis;* body length 6.0 to 8.5 mm.

Head: Punctation of face, although somewhat variable, tending to be slightly less dense than that of *P. fumipennis;* patch of short white setae between antennal sockets inconspicuous, consisting of approximately 10 to 15 setae.

Mesosoma: Punctation of mesoscutum and mesepisternum slightly less dense than that of *P. fumipennis;* white hairs on mesepisternum slightly shorter than those of *P. fumipennis.* First and second submarginal cells (fig. 3) equal in length along posterior margin (except for two specimens). Legs with color brown to dark brown, rarely nearly black or reddish; tibial spurs of middle and hind legs reddish brown; setae on anterior surface of hind femur shorter and somewhat sparser than those of *P. fumipennis;* dark setae on anterior surface of hind tibia less numerous

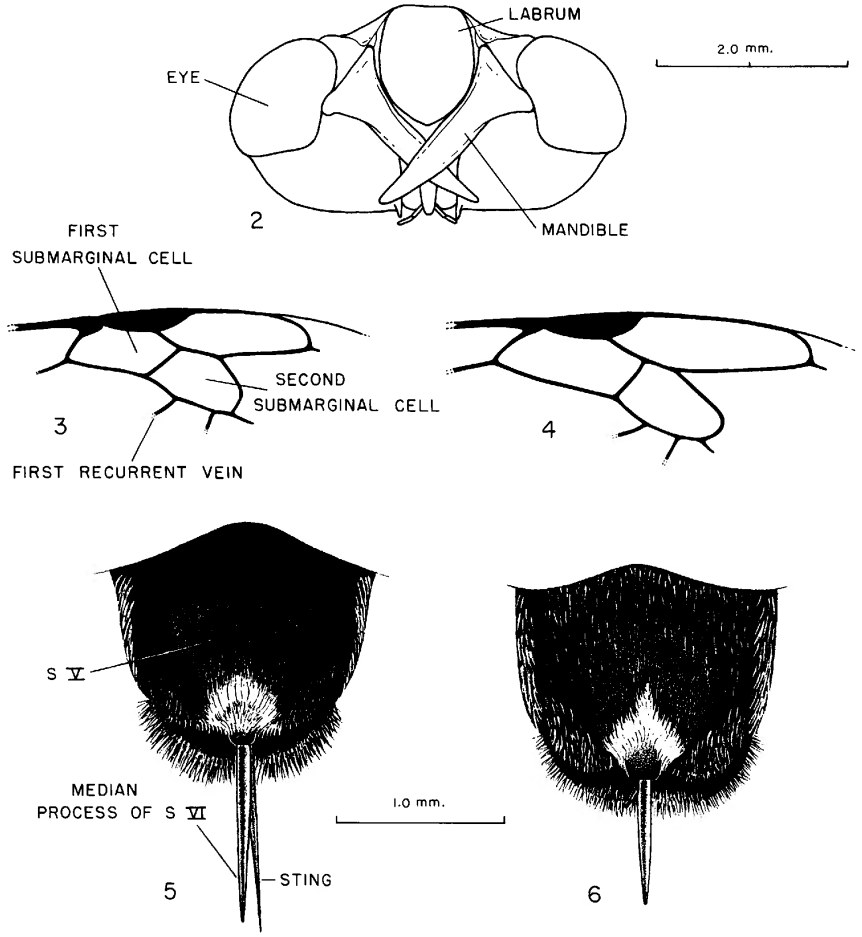


FIG. 2. Head, *Pseudodichroa capensis,* ventral view.

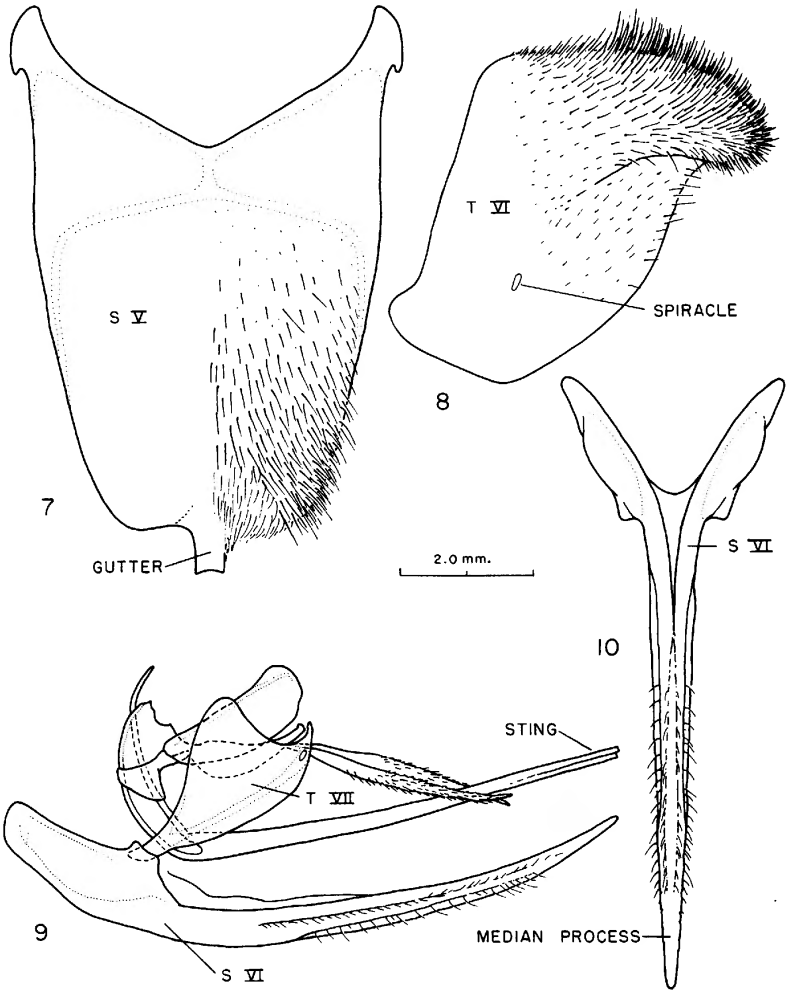
FIGS. 3, 4. Submarginal cells. 3. *Pseudodichroa capensis.* 4. *P. fumipennis.*

FIGS. 5, 6. Tip of metasoma, ventral views. 5. *Pseudodichroa capensis.* 6. *P. fumipennis.*

Scales refer to figures 2 and 5–6, respectively.

than those of *P. fumipennis* and pale setae more abundant; hence tibia and also basitarsus appearing more silvery than those of *P. fumipennis,* when viewed from certain angles.

Metasoma: Color variable, as described for genus. Disc of tergum I with punctures fine, being slightly larger than punctures on posterior margin. Sternum V with light hairs around median gutter forming a shiny crescent (fig. 5).



FIGS. 7–10. *Pseudodichroa capensis.* 7. Metasomal sternum V, ventral view. 8. Metasomal tergum VI, lateral view. 9. Sclerotized parts of external female genitalia and metasomal sternum VI, lateral view; sting broken at tip. 10. Metasomal sternum VI, ventral view.

Scale refers to all figures.

COLLECTION DATA: All Cape Province, Republic of South Africa: Kommetjie, October 29 to November 9, 1966, C. D. Michener and J. G. Rozen, in the American Museum of Natural History; October 15 and 29, 1966, C. D. and B. J. Michener, in the University of Kansas. Rappenberg, Cape Flats, October 1 to 14, 1920, R. E. Turner, in the British Museum (Natural History). Between Somerset West and Strand, October

1, 1925, H. Brauns, in the Transvaal Museum. Ceres District, Cold Bokkeveld, October 15 to 30, 1934, M. Versfeld, in the South African Museum. Clanwilliam, September 8, 1966, C. D. and M. Michener, in the University of Kansas. Vanrhynsdorp, August 5, 1927, H. Brauns, in the Transvaal Museum. Kamieskroon, Namaqualand, September, 1930, "Museum Staff," in the South African Museum.

HOST: *Scrapter longula* (Friese) (Rozen and Michener, 1968). The variability in size of this species suggests that other species of *Scrapter* may also be hosts.

REMARKS: The type of *P. capensis* agrees in almost all respects with the description presented above. It differs both from the description and from other specimens on hand only by being faded; the wings, for example, are much paler than those of other specimens. In general, older specimens of both *P. capensis* and *fumipennis* have the dark color paler than that of the material collected by C. D. Michener and me (though none is so faded as the type of *P. capensis*).

Pseudodichroa capensis is quite variable in size and in the extent of expression of the dark color on the metasoma. One specimen from Vanrhynsdorp (fig. 1: 1) is unique in that there is nearly no dark pigment on the metasoma; only tergum VI is slightly infuscated. In another specimen, from Clanwilliam (fig. 1: 2) both terga V and VI are dark but not terga IV. However, the female from the most northern point, Kamieskroon (fig. 1: 3), is normally dark.

Pseudodichroa fumipennis Bischoff

Figures 1, 4, 6

Pseudodichroa fumipennis BISCHOFF, 1923, p. 596 [female; "aus Java"; Zoologisches Museum, Berlin (type presumably lost)]. ROZEN AND MICHENER, 1968, pp. 9–13 (biology).

DIAGNOSIS: The important features for separating *P. fumipennis* and *capensis* are given in the treatment of the latter.

DESCRIPTION: Body form more robust than that of *P. capensis;* body length 8.5 to 10.0 mm. (type presumably 11.0 mm.).

Head: Punctation of face somewhat denser than that of *P. capensis;* patch of short white setae between antennal sockets more obvious than that of *P. capensis* and consisting of 20 to 30 setae.

Mesosoma: Punctation denser and more contiguous than that of *P. capensis;* white setae on mesepisternum slightly longer than those of *P. capensis.* First submarginal cell (fig. 4) along posterior margin longer than second. Leg color dark brown to black; hence tending to be darker than that of *P. capensis;* tibial spurs of middle and hind legs dark brown

to black; setae on anterior surface of hind femur longer and darker than those of *P. capensis;* dark setae on anterior surface of hind tibia more numerous than those of *P. capensis* and pale setae less abundant; hence tibia and basitarsus appearing less silvery than those of *P. capensis,* when viewed from certain angles.

Metasoma: Dark area at tip of metasoma occupying at most segments IV to VI (on the few specimens that have been collected). Disc of tergum I with most punctures larger and deeper than those of *P. capensis* and much larger than punctures on margin. Sternum V with light hairs in front of median gutter extending anteriorly so that they form a shiny, inverted V (fig. 6).

COLLECTION DATA: All Cape Province, Republic of South Africa: Kommetjie, October 29 to November 9, 1966, C. D. Michener and J. G. Rozen, in the American Museum of Natural History; October 29 to November 9, 1966, J. G. Rozen, in the American Museum of Natural History; October 29, 1966, C. D. Michener, in the University of Kansas. Camps Bay, Cape Peninsula, October 1 to 20, 1920, R. E. Turner, in the British Museum (Natural History). Stellenbosch, October 25, 1925, collector unknown, in the National Museum of Southern Rhodesia.

HOST: *Scrapter crassula* Cockerell (Rozen and Michener, 1968).

REMARKS: As indicated by Rozen and Michener (1968), it seems likely that the type of *P. fumipennis,* presumably from Java and now lost, was mislabeled.

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